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One-Decade Tax for People Well-Being: Case Study in South Lampung District, Province of Lampung, Indonesia

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Abstract: Based on stochastic model, this study want to explain contribution of taxes and retribution to achieve Human Development Index (HDI) in South Lampung District, Province of Lampung, Indonesia. It also investigate the influence of regional macroeconomic variable and expenditure of local government to HDI achievement. The empirical results of the model suggest that three existing stochastic models can be used simultaneously to explain the relationship between fiscal behavior and HDI achievement in South Lampung District. The author also shows several policy scenario on local government expenditure to influence local macroeconomic conditions and HDI.

Key words: Tax, well-being, decentralization, Lampung, Indonesia

INTRODUCTION

Fiscal decentralization is one of the popular topics in diverse parts of the world. It is one form of the meaning extension of decentralization that occurs in changing era on governance perspective (Cheema and Rondinelli, 2007). Various scholars believed that fiscal decentralization is a panacea to solving economic problem (Oates, 1993), reducing/increasing corruption (Alexeev and Habodaszova, 2012; Arikan, 2004), improved macroeconomic governance (Shah, 2006), reducing inequalities between regions (Bahl and Wallace, 2006) and trigger economic growth (Akai *et al*., 2007).

In Indonesia, fiscal decentralization policy occurred since the fall of New Order regime. It is a part of reformulation of relationship between central and local governments. Since 2001, central government increase flow of public funds to local government (in the form of General Allocation Fund and Special Allocation Fund). In their observation, Fengler and Hofman (2009) stated that this policy has received several achievements, namely: people are more content with service now than before, continyuing fiscal consolidation, development spending recovered and sufficient funding for poor regions.

Previous research show various finding on fiscal decentralization. Shah (1998) shows that fiscal decentralization in Indonesia is influenced by politics, bureaucratic, institutional and external of participants. Smoke (2007) shows a lack of coordination and accountability within the framework of fiscal decentralization in Indonesia. While Pepinsky and Wihardja (2011) argue that Indonesia decentralization has had no discernable effect on the country's national-level economic performance. Their suggest that the extreme heterogeneity in endowments, factor immobility and the endogenous deterioration of local governance institution can call now undermine the supposed development-enhancing promises of decentralized government in emerging economies reviews such as Indonesia.

This research is designed to entering debate on fiscal decentralization in Indonesia by focusing on issue how local tax contribute in improving people welfare during one decade (1999-2009). This study also investigate how variable of local macroeconomic and local government expenditure influence level of people welfare. Finally, the researcher analyzed policy scenario to increasing people well-being by manipulating local government expenditure.

MATERIALS AND METHODS

The primary source of data in this research derived from Central Bureau of Statistic South Lampung District (CBSSLD). Data was processed with Minitab software in the Laboratory of Public Policy, Department of Public Administration, University of Lampung. This study uses a quantitative paradigm, particularly stochastic approach (Pindyck and Rubinfeld, 1998). Based on the assumption that each variable are additive, linear and the response is lag to the cause, then we made three structural models as follows:

- Human Development Index (HDI) is a function of fiscal regime (DD), the incidence of poverty (POV), taxes and retribution (PJK_daerah), income tax from province (BGHSL_Pjk), general allocation fund (DAU) and special allocation fund (DAK)

- Tax and retribution (PJK_Daerah) predicted using local government expenditure, especially personnel expenditure (G_Pegw), capital expenditure (G_Capital) and social expenditure (G_Bantuan). Moreover, because of people income tend to correlated with consumption level then we integrate product domestic regional bruto in ours model. We also integrated fiscal regime variable (DD) because of it can influence governance
- Poverty (POV) is a function of fiscal regime (DD), industry (IND_Sh) and agriculture (AGR_Sh) sector contribution in local economy

Three models in the above will generate the following formula as follow:

$$[IPM]_t = \alpha_1 + \alpha_2[DD] + \alpha_3[POV]_{t-n} + \alpha_4[PJK_{Daerah}]_{t-n} + \alpha_5[BGHSL_{Pjk}]_{t-n} + \alpha_6[DAU]_{t-n} + \alpha_7[DAK]_{t-n} + \varepsilon_t \quad (1)$$

$$[PJK\_{Daerah}]_t = \beta_1 + \beta_2[DD] + \beta_3[PDRB\_Kp]_{t-n} + \beta_4[G_{Pegw}]_{t-1} + \beta_5[G_{Modal}]_{t-n} + \beta_6[G_{Bantuan}]_{t-n} + \mu_t \quad (2)$$

$$[POV]_t = \gamma_1 + \gamma_2[DD] + \gamma_3[IND\_Sh]_{t-n} + \gamma_4[AGR\_Sh]_{t-n} + \eta_t \quad (3)$$

Where:

IPM	=	Human development index
PJK_Daerah	=	Local tax and retribution
POV	=	Incidence of poverty
DD	=	Fiscal rezim
BGHSL_Pjk	=	Tax income from province
DAU	=	General allocation fund
DAK	=	Special allocation fund
G_Pegw	=	Personnel expenditure
G_Modal	=	Capital expenditure
G_Bantuan	=	Social expenditure
PDRB_Kp	=	Product domestic regional bruto
AGR_Sh	=	Agricultural sharing in economy
IND_Sh	=	Industry sharing in economy
T	=	Year
N	=	Time lag
α, β and γ	=	Model parameter
ε, μ and η	=	Error

Based on equations, we formulate hypothesis in this study as follows for Eq. 1:

- H_0: $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = \alpha_6 = \alpha_7 = 0$
  There is no variables specified in Eq. 1 affect human development index (IPM) significantly
- H_1: There is value $\neq 0$ between α_1 to α_7
  At least one variable specified in Eq. 1 affect human development index (IPM) significantly

For Eq. 2:

- H_0: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = 0$
  There is no variable specified in Eq. 2 affect local tax (PJK_Daerah) significantly
- H_1: There is value $\neq 0$ between β_1 to β_7
  At least one variable specified in Eq. 2 affect local tax (PJK_Daerah) significantly

For Eq. 3:

- H_0: $\gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = 0$
  There is no variable specified in Eq. 3 affect incidence of Poverty (POV) significantly
- H_1: There is value $\neq 0$ between γ_1 to γ_4
  At least one variable specified in Eq. 3 affect incidence of Poverty (POV) significantly

We used t-test at significance level of 5 and 10% to test each parameter in those equation. F-test used to test of goodness-fit at significance level of 5 and 10%. Expected R^2(adj) for each of those equations is >90%.

After testing hypothesis, we analyzed effect of endogenous variable (personnel expenditure, capital expenditure and social expenditure) to human development index. These endogenous variables is accessible for government of South Lampung District and can influence tax revenue and human development index. We integrate agriculture (AGR_Sh), industry (IND_Sh) and Poverty (POV) variable into our model because of central government give more attention to them through national development program.

RESULTS AND DISCUSSION

Local tax and human devepoment index: As shown in Table 1, local tax (PJK_Daerah), tax income from province (BGHSL_Pjk), general allocation fund (DAU) and special allocation fund (DAK) continues to increase from 2000-2009. Local government expenditure also increasing in this period and may generate multiflier effects (stimulate private investment and improvement people well-being). As indicated in Table 2, contribution of agricultural sector (AGR_Sh) and incidence of Poverty (POV) is decrease in this period. While contribution of industry (IND_Sh) product domestic regional bruto (PDRB_Kp) and human development index (IPM) continue to increase.

Table 3 shows that regression model has high value on goodness of fit as shown by R^2(adj) (100%) and p = 0.008. It is mean that human development index (IPM) diversity in South Lampung District, particularly in observation period can be explained by six predictor variable. It is imply that we reject H_0 and accept H_1 in Eq. 1. Let's we see the influence of each variable in this model (Table 4). First, fiscal rezim (DD) variable. In this

Table 1: Data on local tax, tax income from province, general allocation fund, special allocation fund and local government expenditure in South Lampung District

	Thousand Rupiah (Rp)						
Years	PJK_Daerah	BGHSL_Pjk	DAU	DAK	G_Pegw	G_Modal	G_Bantuan
2000	3,317,334	14,738,960	111,875,610	-	57,664,874	7,659,411	390,613
2001	4,847,976	16,545,701	231,715,968	-	136,281,317	50,297,460	2,436,362
2002	6,457,791	26,328,962	259,389,675	-	176,777,099	33,533,754	1,611,267
2003	9,142,472	33,477,394	321,983,469	1,000,000	211,110,766	97,063,174	917,777
2004	10,174,824	25,459,791	335,148,173	12,050,000	275,944,393	30,100,501	3,535,016
2005	10,850,944	27,957,899	337,196,000	13,890,000	282,296,914	72,083,440	4,528,407
2006	14,175,089	24,516,196	532,654,000	39,160,000	362,560,910	60,748,549	53,705,799
2007	13,887,585	38,891,813	600,921,000	59,110,000	413,923,849	273,396,936	-
2008	18,092,500	40,981,496	658,043,650	77,819,000	479,151,234	189,142,542	-
2009	19,958,568	29,970,578	44,670,385	77,307,000	421,971,408	119,585,005	10,605,959
Mean	11,090,508	27,886,879	343,359,793	28,033,600	281,768,276	93,361,077	7,773,120
SD	5,482,831	8,494,101	201,128,479	32,557,597	137,456,302	82,046,852	16,448,961

CBSSLD (2009b)

Table 2: Data on people well-being and regional macroeconomic in South Lampung District

Years	IND_Sh (%)**	AGR_Sh (%)**	PDRB_Kp (million Rp)**	Poverty (%)***	IPM***
2000	11.81	52.62	3,075.80	31.64	58.61
2001	11.71	50.57	3,103.50	31.53	59.84
2002	11.11	49.57	3,180.40	30.37	60.30
2003	10.92	48.72	3,219.30	28.52	64.40
2004	10.93	46.57	3,320.10	28.49	66.50
2005	11.04	46.70	3,246.50	27.84	67.20
2006	10.34	46.74	3,866.50	26.28	67.80
2007	10.11	43.78	3,997.40	26.94	68.39
2008	9.27	45.82	4,167.50	24.72	68.79
2009	-	-	-	22.83	69.51
Mean	10.80	47.90	3,464.11	27.92	65.13
SD	0.80	2.71	422.85	2.86	4.09

**CBSSLD (2009a); ***CBSSLD (2009c)

Table 3: t-test regression for human development index as function of local tax, tax income from province, poverty, general allocation fund and special allocation fund

Source	df	SS	MS	F-value	p-value
Regression	6	88.564	14.761	8301.0	0.008***
Error	1	0.002	0.002		
Total	7	88.566			

S = 0.04217; R^2 = 100.0%; R^2(adj) = 100.0%; Data analysis in 2011

Table 4: F-test regression for human development index as function of local tax, tax income from province, poverty, general allocation fund and special allocation fund

Predictors	Coef.	SD	t-values	p-values
Constant	31.41900000	2.82200000	11.14	0.057*
DD	2.30491000	0.09771000	23.59	0.027*
POV_{t-1}	0.76290000	0.08351000	9.14	0.069*
PJK_Daerah_{t-1}	0.00000143	0.00000006	23.30	0.027**
$BGHSL\_Pjk_{t-1}$	0.00000008	0.00000000	18.44	0.034**
DAU_{t-1}	-0.00000001	0.00000000	-21.27	0.030**
DAK_{t-1}	0.00000001	0.00000000	2.94	0.209

Data analysis in 2011

model, fiscal rezim is dummy variable. The coefficient of this variable is 2.30491 with p = 0.057 (or 5.7 or <10%). This means that there is a real difference between before and after the fiscal decentralization on human development index (IPM) achievement in South Lampung District. The magnitude of these differences is 2.3 times.

Second, the incidence of poverty (POV) variable. This study found that the level of poverty in previous year has influence human development index (IPM) achievement in South Lampung District as shown by coefficient value (0.7629) and p = 0.069 (or 6.9 or <10%). It is mean that if poverty (POV) increased 1% in last year, then human development index (IPM) will also increased of 0.7629 in the next year. Positive relationship between poverty and human development index variable has caused by high rate poverty in South Lampung District and low level of human development index.

Third, local tax (PJK_Daerah) variable. Empirical result show that local tax has real contribution to human development index (IPM) achievement in South Lampung District as show by coefficient value (143×10^{-8}) and p = 0.027 (or 2.7 or <5%). It is meaning that if local tax increased by Rp1000 in the last year then human development index will increase by 143×10^{-8}. Even its magnitude is small but it is a real thing. This phenomenon looks like the quantity of salt required in a particular foods: volume is not large but very decisive flavor.

Fourth, tax income from province (BGHSL_Pjk). This variable also has contribution to human development index (IPM). Its coefficient is 8×10^{-8} and p = 0.034 (or 3.4 or <5%). If other variables are fixed then any increase in BGHSL_Pjk as Rp1,000 this year then human

development index will increase for 8×10^{-8} in the next year. Similar with local tax, BGHSL_Pjk has small magnitude but still important thing.

Fifth, general allocation funds (DAU) variable. As shown in Table 4, DAU has negative effect to human development index (IPM). It is indicated by its coefficient (-1×10^{-8}) and p = 0.30 (or 3.0 or <5%). In other words, if DAU variable increase by Rp1000 then IPM value will decrease as -1×10^{-8}.

Sixth, special allocation funds (DAK) variable. Its coefficient is 1×10^{-8} and p = 0.209 (or 20.9and or >10%). If DAK increase as Rp1000 in last year then human development index (IPM) will increase as 1×10^{-8}. It is small effect but logic because of central government does not give DAK to local government every year. There is emergency principle in process of DAK allocation such as natural disaster or high priority target in development process.

After reviewing the influence of each variable partially, it is time to show the effect of all variable to human development index (IPM) simultaneously. Equation 4 summarized our model. In this model with Constanta-value (31.4) and p = 0.057 (or 5.7 or <10%) and if others factor are fix then human development index (IPM) will has 31.4 points:

$$\begin{aligned} IPM_t &= 31.4 + 2.30DD + 0.763POV_{t-1} + \\ &\quad 0.00000143PJK\_Daerah_{t-1} + \\ &\quad 0.0000008BGHSL\_Pjk_{t-1} + \\ &\quad -0.0000001DAU_{t-1} + 0.0000001DAK_{t-1} \\ R^2(adj) &= 100.0\% \end{aligned} \quad (4)$$

Local tax as function of people revenue and local government expenditure: As shown in Table 5, only government spending on personnel salaries (G_Pegw) can affect local tax (PJK_Daerah) significantly as shown by regression coefficient (0.030193) and p = 0.025 (or 2.5 or <5%). Based on this result, we reject H_0 and accept H_1 in Eq. 2. This means that if other factors is remain, then any increase in government spending on personnel salarie by Rp1,000, then there will be increase local tax (PJK_Daerah) by Rp30,193.

Table 5: t-test regression for local tax as function of product domestic regional bruto and local government expenditure

Predictor	Coef.	SD	t-values	p-values
Constant	16349965	14242958	1.15	0.334
DD	515769	1044711	0.49	0.655
PDRB_Kpt	-5035	4866	-1.03	0.377
G_Pegw	0.030193	0.007203	4.19	0.025
G_Modal	0.004271	0.007898	0.54	0.626
G_Bantuan	0.07949	0.04713	1.69	0.190

Data analysis in 2011

The influence of others variable is not significant (or considered equal to zero). It is show by p = 0.655-0.190. It is suggest that only increasing in personnel salaries expenditure (G_Pegw) will improve government revenue from local tax (PJK_Daerah). However, it is a problematic situation because of local government does not have authority to increase local government personnel salaries. This authority still handled by central government through general allocation funds (DAU). While civil service salary increasing will affect inflation by 10%.

To exit from this situation, government of South Lampung District could focus on their attention to the exercise of power, particularly in public service. Local government should make better public service. Improving public service quality will stimulate local economy in all sectors (agriculture, industry, trading, service and so on) and create room for local government to collecting local tax (PJK_Daerah).

Relationship between local tax (PJK_Daerah) and all variable is visualized by Eq. 5. Based on R^2(adj) value, we can say that all variable has influence local tax by 98.3% and others factor explain local tax change by 1.7%. Although, there is only one variable (G_Pegw) can influence local tax (PJK_Daerah) but this model still useful to determine human development index targeting (Table 6):

$$\begin{aligned} PJK\_Daerah &= 16349965 + 515769DD\text{-}5035PDRB\_Kpt + \\ &\quad 0.0302G\_Pegw + 0.00427G\text{-}Modal + \\ &\quad 0.0795G\text{-}Bantuan \\ R^2 &= 99.4\%,\ R^2(adj) = 98.3\% \end{aligned} \quad (5)$$

Poverty and local economy: In this study, we select agriculture and industry sector to representing local economy of South Lampung District. The agricultural sector was selected because it has free entry character. It is mean that anyone who can not be accommodated in other sectors will still be able to be accommodated in this sector. Industry sector was selected because of its prospective to develop in the future. When peoples have better education and income through development programs, then people tend to left agricultural sector.

In other words, there must be a strong link between agricultural sector as the foundation of economy and industrial sector as the goal of structural transformation

Table 6: F-test regression for local tax as function of product domestic regional bruto and local government expenditure

Source	df	SS	MS	F-value	p-value
Regression	5	1.82037E+14	3.64073E+13	96.18	0.002
Error	3	1.13562E+12	3.78541E+11		
Total	8	1.83172E+14			

S = 615257; R^2 = 99.4%; R^2(adj) = 98.3%; Data analysis in 2011

Table 7: t-test regression for poverty as function of agricultural and industry contribution in local economy

Predictors	Coef.	SD	t-values	p-values
Constant	-4.2610	8.2330	-0.52	0.632
DD	-0.6976	0.8861	-0.79	0.475
IND_Sh_{t-1}	0.2310	1.0610	0.22	0.839
AGR_Sh_{t-1}	0.6299	0.2077	3.03	0.039**

Data analysis in 2011

Table 8: F-test regression for poverty as function of agriculture and industry contribution in local economy

Source	df	SS	MS	F-value	p-value
Regression	3	31.758	10.586	25.87	0.004***
Error	4	1.637	0.409		
Total	7	33.395			

S = 0.6397; R^2 = 95.1%; R^2(adj) = 91.4%; Data analysis in 2011

of local economy. If agricultural sector has continued marginalization (or rural poverty more persistent) then industrial sector should be a foundation in line with the increase of people well-being as reflected by human development index (IPM). Others sector should follow these sectors.

Empirical result on poverty (POV) as function of agricultural (AGR_Sh) and industrial (IND_Sh) contribution in local economy has presented by Table 7 and 8. As shown in Table 7, there is only agricultural sector (AGR_Sh) which have positive influence as a predictor of the incidence of poverty (POV) in South Lampung District as indicated by coefficient value (0.6299) and p = 0.039 (or 3.9 or <5%). We, then, reject H_0 and accept H_1 in Eq. 3.

This influence was happening both before and after implementation of fiscal decentralization. It is meaning that when others factor is fixed then each increasing 1% in agricultural sector will increase poverty by 0.6299. Consequently, local government should decreasing contribution of agricultural sector in local economy by 1% to reduced proverty by 0.6299%. Mathematically, it is not difficult calculation. Empirically, local government should hard working to decreasing 1% of agricultural contribution in local economy. Local government should give incentives and crate creative policy in other sectors (for example, manufacturing industry, creative industry, education and so on) so that they can growth by 1%.

The influence of all variable to poverty is presented by Eq. 6. R^2(adj) value show that 91.4% of poverty change could be explained by agriculture (AGR_Sh) and industry (IND_Sh). While 8.6% of poverty change explained by others variable:

$$POV_t = -4.26 - 0.698DD + 0.23\ IND\_Sh_{t-1} + 0.630\ AGR\_Sh_{t-1}$$
$$R^2(adj) = 91.4\% \quad (6)$$

Policy scenario for human development index: This analysis aimed to determine the effect of changes in endogenous variables (AGR-Sh, IND_Sh, G-Pegw and POV) to human development index (IPM). All of endegouns variable are accessible for government of South Lampung District. The initial scenario to be developed as follow: first, it is assumed that agricultur (AGR_Sh) will decrease and industry (IND_Sh) will increase by 1% at national level. We choose 2008 data due to data available. We know change the incidence of Poverty (POV) using Eq. 4. Second, we also assumed that government expenditure on personnel (G_Pegw) will increase ranging from 5, 10, 15 and 25%. We use Eq. 5 to predict information about local government revenue from local tax (PJK_Daerah). Third, using data in the first and the second step, we generate policy scenario using Eq. 4. This policy scenario presented in Table 9. In 2009, South Lampung District has reached human development index (IPM) in 69.51 point. Based on this achievment, we recommend government of South Lampung District to choose scenario 2, 4 and 6 as strategy to improve human development index (IPM). Whatever policy scenario choose by government of South Lampung District, it is still important to aware about other factors that influence this policy.

Table 9: Policy scenario for human development index by manipulating agriculture, industry and local government expenditure

Policy scenario	Decreasing AGR_Sh (%)	Increasing IND_Sh (%)	Increasing G_Peg (%)	HDI target
1	1	1	20	61.89
2	1	1	25	78.53
3	5	5	20	63.40
4	5	5	25	80.04
5	10	10	20	64.64
6	10	10	25	81.28

Data analysis in 2011

In our minds, local government iniative to decrease agricultural and increasing industrial sharing in local economy is not sectoral problem. Although, local government has a big maneuver room to making public policy but they cannot solve this problem alone. Local government should open participation gate broadly for market and civil society actor in formulation and implementing this policy. In this manner, we asserted that tax is not a problem of tax but it is a problem of governance.

CONCLUSION

There are two findings from this study. First, relationship between human development index (IPM) and endogenous variable (local tax, poverty, local government expenditures and local economy) expressed in Eq. 4-6. In other words, various policy from local government still play important role in order to maintain people well-being.

Second, if government expenditure on personnel (G_Pegw) increase 25% from its value in 2008 then

contribution of agriculture (AGR_Sh) to local economy will decrease 1%, industry sharing (IND_Sh) to local economy will increase 1% and human development index (IPM) will reached 78.53 point; if agricultural sharing in local economy decrease 5%, industrial contribution to local economy increase 5% then human development index will reach 80.04 point; if agricultural sharing decrease 1%, industry increase 1% and human development index will reached 81.28 point.

In future, it is important to investigate relationship between tax and structural transformation in income area. Several variables excluded in our model such as farmer exchange rate and consumer price index could be considered as a predictor of human development index and poverty. In addition, Indonesia will go into ASEAN Eonomic Community (AEC) in 2015. We suggest next research to study how does AEC influence human development index in local level.

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